U.S. DEPARTMENT OF COMMERCE PATENT & TRADEMARK OFFICE

B/O Form PTO-1390	**Transmittal Letter to the United States Designated/Elected Office (DO/EO/US) Concerning a Filing Under *35 USC 371***	*Attorney's Docket Number* **324-138**
		U.S Application Number (if known) 09/889570
International Application Number **PCT/FR99/03324**	*International Filing Date* **28 December 1999**	*Priority Date Claimed* **31 December 1998**
Title of Invention **DIALING SYSTEM IN A MOBILE RADIO TERMINAL AFTER AN INTERNATIONAL TRANSFER**		
Applicant(s) for DO/EO/US **Ramzi SANBAR**		

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items under *35 USC 371*:

1. ☒ This is a **FIRST** submission of items concerning a filing under *35 USC 371*.

2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under *35 USC 371*.

3. ☐ This express request to begin national examination procedures *(35 USC 371(f))* at any time rather than delay examination until the expiration of the applicable time limit set in *35 USC 371(b)* and PCT Articles 22 and 39(1).

4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.

5. ☒ A copy of the International Application as filed *35 USC 371(c)(2)*
   a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☒ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).

6. ☒ A translation of the International Application into English *(35 USC 371(c)(2))*.

7. ☒ Amendments to the claims of the International Application under PCT Article 19 *(35 USC 371(c)(3))*
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☒ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.

8. ☐ A translation of the amendments to the claims under PCT Article 19 *(35 USC 371(c)(3))*.

9. ☐ An oath or declaration of the inventor(s) *(35 USC 371(c)(4))*. (☐ Executed ☐ Unexecuted)

10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 *(35 USC 371(c)(5))*.

Items 11 to 16 below concern other document(s) or information included:

11. ☒ An Information Disclosure Statement under *37 CFR 1.97* and *1.98*.

12. ☐ An assignment document for recording. A separate cover sheet in compliance with *37 CFR 3.28* and *3.31* is included.

13. ☐ A **FIRST** preliminary amendment.
    ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.

14. ☐ A substitute specification.

15. ☐ A change of power of attorney and/or address letter.

16. ☒ Other items or information: Applicant is entitled to Small Entity Status

Application Number (if known)	International Application Number	Attorney's Docket Number
09/869570	PCT/FR99/03324	324-138

	CALCULATIONS	PTO USE ONLY
☒ *The following fees are submitted:* **Basic National Fee** *(37 CFR 1.492(a)(1)-(5))*:		
☒ Search report has been prepared by the EPO or JPO 860.00		
☐ International Preliminary Examination Fee paid to USPTO *(37 CFR 1.482)* $690.00		
☐ No International Preliminary Examination Fee paid to USPTO *(37 CFR 1.482)* but International Search Fee paid to USPTO *(37 CFR 1.445(a)(2))* $710.00		
☐ Neither International Preliminary Examination Fee *(37 CFR 1.482)* nor International Search Fee *(37 CFR 1.445(a)(2))* paid to USPTO $1000.00		
☐ International Preliminary Examination Fee paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) $100.00		
ENTER APPROPRIATE BASIC FEE AMOUNT	$ 860.00	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date *(37 CFR 1.492(e))*.		

Claims	Number Filed	Number Extra	Rate		
Total Claims	17 -20 =	0	× $18.00	$ 0.00	
Independent Claims	3 -3 =	0	× $80.00	$ 0.00	
Multiple dependent claim(s) *(if applicable)*			+ $270.00	$ 0.00	
TOTAL OF ABOVE CALCULATIONS				**$ 860.00**	
Reduction by ½ for filing by small entity, if applicable. Verified Small Entity Statements are not required.				-430.00	
SUBTOTAL				**$ 430.00**	
Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date *(37 CFR 1.492(f))*.				$ N/A	
TOTAL NATIONAL FEE				**$ 430.00**	
Fee for recording the enclosed assignment *(37 CFR 1.21(h))*. The assignment must be accompanied by an appropriate cover sheet *(37 CFR 3.28, 3.31)*. **$40.00** per property.				$ N/A	
TOTAL FEES ENCLOSED				$ 430.00	
Amount to be:				**Refunded:**	$
				Charged:	$

a. ☒ A credit card authorization in the amount of **$430.00** to cover the fees is enclosed.

b. ☐ Please charge my **Deposit Account Number 07-1337** in the amount of $ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to **Deposit Account Number 07-1337**. A duplicate copy of this sheet is enclosed.

Note: Where an appropriate time limit under *37 CFR 1.494* or *1.495* has not been met, a petition to revive *(37 CFR 1.137(a) or (b))* must be filed and granted to restore the application to pending status.

LOWE HAUPTMAN GILMAN & BERNER, LLP
1700 Diagonal Road
Suite 310
Alexandria, Virginia 22314
(703) 684-1111

Respectfully Submitted,

Allan M. Lowe
Attorney for Applicant
Registration Number: 19,641

29 June 2001

SPECIFICATION

TO WHOM IT MAY CONCERN

Be it known that I, Ramzi SANBAR, citizen of the French Republic and residing at :

- 3 Rutland Court, Rutland Gardens, London SW7 1BN, GRANDE-BRETAGNE

have invented new and useful improvements in :

Dialing in a mobile radio telephone terminal after an international transfer

of which the following is a specification :

BACKROUND OF THE INVENTION

1 - Field of the Invention

The present invention relates generally to adaptation of telephone numbers in a radio telephone terminal when it moves from a home radio telephone network to a foreign radio telephone network.

2 - Description of the Prior Art

It is assumed in the remainder of the description that the home radio telephone network is , for example, one of the three French national cellular radio telephone networks (Public Land Mobile Networks PLMN): GSM 900/FRANCE TELECOM, GSM 900/CEGETEL and DCS 1800/BOUYGUES TELECOM, and the foreign radio telephone network is in Great Britain or in Germany.

As shown in FIG. 1, the French national switched telephone network RTC_N is essentially made up of routing autonomy switches CAA and transit switching centers (not shown) between them. Some of the switches CAA serve as gateways between mobile service switching centers MSC of the three radio telephone networks RRN_0, RRN_1 and RRN_2 previously cited.

The architecture of one RRN_0 of the three radio telephone networks is shown in more detail in FIG. 1 and this network will be considered as the home network, with whose operator a subscriber carrying a mobile radio telephone terminal MS has entered into a contract. A mobile services switching center MSC in the network RRN_0

has a role equivalent to a switch CAA in the network RTC_N, and also manages telephone calls for mobile radio telephone terminals located in its location area at a given time. The switching center MSC is associated with a visitor location register VLR which contains contract and temporary location characteristics of visitor mobile terminals, in fact of removable chip cards known as Subscriber Identity Modules SIM contained in the visiting terminals.

Each switching center MSC serves plural fixed network subsystems (NSS) each comprising a base station controller BSC managing the allocation of digital channels to visitor mobile terminals, the power of the base transceiver stations and intercellular handovers between base transceiver stations. Each base transceiver station BTS covers a radioelectrical cell in which mobile terminals are located at a given time.

The national radio telephone network RRN_0 further includes a home location register HLR which includes, for each terminal MS for a subscriber having a contract with the network RRN_0, the international mobile subscriber identity IMSI, the subscriber directory number MSISDN (Mobile Station ISDN Number), their contract profile and the number of the visitor location register VLR which is updated each time that the mobile radio telephone terminal MS is transferred between two location areas in the network RRN_0. The register HLR exchanges signals with the switching centers/registers MSC/VLR via a signaling network with signaling channels SS7 (Signaling System number 7). The registers VLR and HLR are also connected to signaling points of the signaling network associated

with the switched telephone network RTC_N, in particular for signaling the setting up of calls between a terminal of the network RRN_1 and any other terminal of the fixed network RTC_N or of one of the radio telephone networks RRN_0 to RRN_2.

FIG. 1 also shows diagrammatically a "foreign" switched telephone network RTC_E, for example a British or German network, and a foreign radio telephone network RR_E served by the network RTC_E. To set up international calls, the national network RTC_N includes international transit switching centers CTI connected to the foreign switched telephone networks, such as the network RTC_E. Some radio telephone networks, such as the network RRN_2, have their own international transit switching center TSC. Each country is indicated in an international telephone number by a country code CC with one, two, three or four digits, for example 33 for France, 44 for Great Britain, 49 for Germany, 1 for the USA, 352 for Luxembourg, etc.

In the worldwide numbering scheme each subscriber has a unique directory telephone number MSISDN which takes the form CC NN, in which NN denotes the meaningful national number. In France for example, NN is equal to I AB PQ MCDU, where I denotes the trunk indicator, i.e. the national destination code of the network with which the subscriber has entered into a contract, for example 1 for the Ile de France region, 4 for the south-east France region, 6 for the national radio telephone networks, and AB PQ MCDU is the subscriber number allocated by the network operator. When a national call is set up between two mobile or fixed terminals of the national network

RTC_N, the national number of the called party transits between the corresponding switching centers MSC and/or switches CAA. When an international call is set up between a terminal of the national network RTC_N and a terminal of the foreign network RTC_E, the international number of the foreign called party MSISDN = CC NN passes through the corresponding switching centers MSC and/or switches CAA of the network RTC_N, the international transit switching center CTI, the corresponding switches CAA_E, and possibly the switching centers MSC_E of the foreign network RTC_E.

For the subscriber himself, in this instance the subscriber of a mobile radio telephone terminal MS, there are currently three different ways to enter a called telephone number NA.

FIG. 2 shows a prior art dialing flowchart for composing a SET UP message which is transmitted by the mobile terminal MS to the switching center MSC after the call is confirmed by pressing a specific key, for example a navigation key on the keypad of the telephone, requests a radio channel, and exchanges authentication and encryption messages.

A subscriber's mobile radio telephone terminal MS includes a removable microprocessor module, called as a SIM chip card, connected to a bus of the microprocessor-based digital circuit in the terminal, the bus serving the keypad, display and peripheral device connectors of the mobile terminal. The chip card SIM (see FIG. 1) includes a microprocessor, a read-only memory ROM containing the operating system of the card and dedicated

application algorithms, a non-volatile memory EEPROM which contains all of the characteristics associated with the subscriber, such as their identity IMSI, contract profile, list of called numbers with names, security data (confidential code), etc., and a random-access memory RAM for processing data received from and transmitted to the digital circuit of the terminal. In particular, the flowchart shown in FIG. 2 is managed by the read-only memory ROM in collaboration with the directory of telephone numbers and the last dialed number in the memory EEPROM in order to compose the SET UP message in the memory RAM.

In a first step E1, the subscriber chooses between manual entry of the called party number NA on the keypad to be written into the memory EEPROM in the next step E2, or by making a selection from a menu on the display of the terminal by pressing keys or by spoken commands if the terminal includes a voice recognition device, the directory of telephone numbers already stored in the memory EEPROM after searching for the called party by name in the next step E3.

The called party number NA entered on the keypad or selected by reading the memory EEPROM and confirmed takes the form NA = EN NN = EN I AB PQ MCDU. EN denotes a header which has one of the following three configurations:

1) EN = 0 = trunk prefix, if the subscriber has entered or selected only a ten-digit French "national" number starting with the predetermined digit 0, for example 0 NN = 01 45 81 74 57 for a called party in the Ile-de-France region ;

2) EN = 00 CC, if the subscriber has entered or selected a number MSISDN preceded by the international prefix 00, which is not accepted in all foreign telephone networks RTC_E, for example 00 49 NN for a called party in Germany or 00 33 NN for a national called party in France ;

3) EN = + CC, if the subscriber has entered or selected a number MSISDN preceded by the international code +, which is a symbol found on the star * key of the keypad and recognized in all foreign telephone networks RTC_E, for example + 44 NN for a called party in Great Britain or + 33 NN for a national called party in France.

The next step E4 scrutinizes the format of the called party number NA, and in particular the header EN, after reading the called party number NA in the memory EEPROM.

If the called party number NA is 0I AB PQ MCDU, i.e. if EN = 0, it is of the open format and a Type-Of-Number field TON occupying bits 5, 6 and 7 in a third byte of the SET UP message, the next five bytes of which contain the digits of the national number NN in binary coded decimal BCD, is set to zero in step E5: TON = 0. Similarly, if the called party number NA is 00 CC NN, it is in the open format and the field TON is TON = 0 in step E5. In both cases, in step E6 the called party number NA is inserted, without changing it, into the SET UP message which in the final step EF is transmitted by the mobile terminal MS to the mobile services switching center MSC to which it is temporarily logged on.

If in step E4 the called party number NA includes the international code +, i.e. if it is in the

international format + CC NN, the next step E8 sets the type-of-number field TON to 1: TON = 1, and removes the international prefix + from the called party number NA. In the next step E9 the called party number MSISDN = CC NN is inserted into the SET UP message which is finally transmitted by the mobile terminal MS in the final step EF.

In the mobile services switching center MSC to which the radio telephone terminal MS is logged on, the TON field in the SET UP message is read in order to insert the meaningful national or international number into the call request message to other switches in the direction of the called party. If TON = 0, the national prefix 0 is removed and the significant national number NN is inserted into the call request message, or the international prefix 00 is removed and the meaningful international number CC NN is inserted into the call request message unless the code CC is that of the country of origin, i.e. CC = CC_0 = 33 for France. If TON = 1, the international number received in the SET UP message is inserted without changing it into the call request message if the code CC is that of a foreign country, in this instance a code other than the code CC_0 = 33 for France. If TON = 0 and CC = 33 or TON = 1 and CC = 33 the country of origin code, here that of France, is removed and only the significant national number NN is inserted into the call request message.

If the subscriber of the mobile terminal MS is traveling abroad as indicated by the notation MS' in FIG. 1 and wishes to set up a call via a radio telephone

network RR_E connected to a foreign switched telephone network RTC_E, the subscriber can reliably use only called party numbers in the international format NA = + CC NN, or, in some countries, where applicable, called party numbers in the open format NA = 00 CC NN. Not all of the many called party numbers stored in the open format 0 NN can be used, and have to be entered again after the code + or the prefix 00, followed by the code of the country of origin, here CC_0 = 33 for France.

What is more, subscriber who is in the habit of storing called party numbers in their country of origin in the open format 0 NN will be tempted to enable the option to read such numbers, and after having received a disabling message or having conversed with an unintended foreign subscriber, will be obliged to enter the number again or to store the number again in the memory EEPROM with the format 00 CC_0 NN or + CC_0 NN.

OBJECT OF THE INVENTION

The present invention remedies the above drawbacks when a subscriber is traveling abroad so that any called party number of the country of origin already stored in the mobile radio telephone terminal or entered in the open format 0 NN is converted to the form of an international number CC_0 NN for the country of origin, without interfering with or modifying the number adaptation functions in the foreign switching centers MSC_E and switches CAA_E and the national switches CAA and national switching centers MSC through which call request messages from the radio telephone terminal pass.

SUMMARY OF THE INVENTION

Accordingly, a method of dialing used in a radio telephone terminal is characterized by the following steps if a called party number is not an international number :

- determining the indicator of the country in which the terminal is currently located,
- comparing a country-of-origin indicator to the determined indicator of the country in which the terminal is currently located,
- not modifying the called party number if the compared country indicators are identical, and
- automatically adding a country-of-origin code to the beginning of the called party number if the country indicators compared are different.

Thus the called party number is first entered and read in the memory of the terminal, or is read in the directory of telephone numbers already stored in the memory of the terminal, and the step of comparing succeeds in reading the called party number in the memory of the terminal.

In this way, open format called party numbers of the country of origin or residence of the subscriber are still used and are converted to the international format only when the subscriber is abroad.

The-country-of-origin indicator is read,

either in a subscriber identity stored in the terminal and fixed by the subscription,

or in a dedicated field of a memory of the terminal, which can be programmed by the subscriber in order to enter therein the indicator of their country of residence, for which many telephone numbers are stored in the terminal, in preference to the indicator of the contract country which is contained in the subscriber identity and which may be different from the indicator of the country of residence.

The indicator of the country in which the terminal is currently locator is determined by reading in a location area identification stored in the terminal and updated on each transfer to a different location area and therefore, in particular, in the event of a transfer from a national network to a foreign network, or vice versa. According to another variant, the step of determining includes the following steps before the step of comparing step : selecting a radio telephone network of the country in which the terminal is currently located from a table of networks stored in the terminal, and reading the indicator of the country in which the terminal is currently located in the table in correspondence with the selected network. The step of selecting involves action by the subscriber, and this embodiment is semi-automatic, compared to the first embodiment relating to reading the country indicator in the location area identification, which is automatic.

In practice, a trunk prefix is included at the beginning of the called party number. The method then includes removing a trunk prefix from the called party number before the step of adding. The method can include removing a trunk prefix from the called party number

before the step of adding if the compared country indicators are different.

The country-of-origin code is preferably read in a dedicated field of a programmable memory of the terminal or can be read in correspondence with the country-of-origin indicator in a table of countries stored in the terminal.

When it has been processed the called party number is inserted into a dialing set up message transmitted by the terminal which contains a type-of-number field, i.e. a field indicating the open or international format. The method then includes setting a type-of-number field to an international format state if the compared country indicators are different.

Preferably, after the step of adding, the method includes a step of adding an international code to the beginning of the called party number in order to write it as an international number in a memory of the terminal, in particular instead of the initial called party number if the latter is already stored in the directory of telephone numbers.

If a called party number is preceded by an international code or prefix, the international code or prefix is removed from the above called party number. The type-of-number field included in a dialing set up message transmitted by the terminal is set to an international format state if the called party number is a number preceded by an international code or prefix.

The step of comparing step preferably follows on from reading the called party number in a memory of the terminal.

The invention also relates to a radio telephone, or a subscriber identification module that can be inserted in a radio telephone terminal, containing in its memory a dialing algorithm for implementing the dialing method according to the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Other features and advantages of the present invention will become more clearly apparent on reading the following description of several preferred embodiments of the invention, which description is given with reference to the accompanying drawings, in which:

- FIG. 1 is a block flowchart of radio telephone networks in the context of an international telephone call and has already been commented on ;
- FIG. 2 is a dialing flowchart used in a prior art mobile radio telephone terminal and has already been commented on ; and
- FIG. 3 is a dialing algorithm used in a mobile radio telephone terminal according to the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The dialing method according to the invention shown in FIG. 3 and implemented in the form of software in the read-only memory ROM of the card SIM (FIG. 1) of the radio telephone terminal MS of the subscriber includes the steps E1 and E9 and EF of the FIG. 2 flowchart implemented in a SIM microprocessor card of a prior art mobile radio telephone terminal.

The successive steps E7, E8, E9 and EF are executed if in step E4 the called party number NA begins with the international code +, i.e. is in the international format NA = + CC NN, with the country code CC of the country of origin, CC_0 = 33 for France, in which the subscriber-owner of the card SIM has entered into a contract, or that of a foreign country, for example CC = 44 for Great Britain or CC = 49 for Germany.

The successive steps E4, E5, E6' = E6 and EF already described with reference to FIG. 2 are executed if the called party number NA begins with the international prefix 00 and is in the open format NA = 00 CC NN, whether the country code CC is that of the country of origin CC_0 = 33 or that of a foreign country, for example 44 or 49.

These two called party number configurations remain unchanged because the first is accepted by all telephone networks worldwide and the second is accepted by most foreign telephone networks. The subscriber re-uses these two configurations of the called party number when traveling abroad, for example using their mobile radio telephone terminal situated at MS' in the coverage area of a mobile services switching center MSC_E of the foreign radio telephone network RR_E shown in FIG. 1 to call a called party in a foreign country, including the country in which the subscriber is currently located, or even in the subscriber's country of origin, here France.

As an alternative to this, for the called party number to be acceptable in all countries, even if it originally starts with the prefix 00, step E6' is replaced by a step E6" during which the TON field is set

to 1 and the prefix 00 is eliminated in order to insert TON = 1 and CC NN into the SET UP message in the next step E9, as shown in dashed outline in FIG. 3.

If subscriber is traveling abroad, outside their country of origin, i.e. France, and wishes to use their mobile radio telephone terminal at MS' (FIG. 1) to request the setting up of a telephone call with a called party situated in the subscriber's country of origin, without changing their dialing habits, the subscriber enters on the keypad, or where applicable speaks, the number of the called party in step E2, or searches for this called party by name, where applicable by speaking it, in the directory stored in the card SIM of their terminal MS, and enables the name so that the number is shown on the display of the terminal MS in step E3. The number of the called party in the country of origin begins with the trunk prefix 0 and is in the open format NA = 0 NN, for example 04 42 36 50 00. The switching center MSC_E of the foreign radio telephone network RR_E removes the prefix 0 from the number NA received in the SET UP message (step E6) according to the prior art, and as a result of this the foreign telephone network RTC_E sets up a call to an unintended called party in the country in which the subscriber is located, or does not recognize the prefix 0 and then refuses to set up the requested call. Whichever of these situations applies, the subscriber fails to communicate with the called party in the country of origin according to the prior art.

As shown in FIG. 3, if NA = 00 CC NN, the

invention introduces steps S1 to S9 and a step E6' analogous to the step E6, between the steps E5 and EF.

If the called party number is in the open format, and after the type-of-number field TON has been set to 0 in step E5, step S1 distinguishes between the national or international character of the header EN in the called party number NA = EN NN read in the memory EEPROM of the card SIM. If the number NA starts with the international prefix, i.e. with a header EN equal to 00 CC, the read called party number NA = 00 CC NN, for example with the country code CC equal to 44, 49 or 33, is inserted with the field TON = 0 into the SET UP message in step E6' and is transmitted by the terminal MS' to the foreign mobile services switching center MSC_E in step EF, as in the prior art shown in the successive steps E5, E6 and EF in FIG. 2.

If step S1 detects the trunk prefix 0 at the beginning of the called party number NA in the form NA = 0 NN = 0I AB PQ MCDU, the next three steps S2, S3 and S4 are executed in the memory RAM of the card SIM.

Step S2 reads in the memory EEPROM of the card SIM a mobile country code indicator MCC_0 of the subscriber's country of origin, here MCC_0 = 208 for France, in the first three-digit field of the subscriber's international mobile subscriber identity IMSI. The IMSI identity also contains the mobile network code indicator MNC_0 of the subscriber's home radio telephone network RRN_0 in a second field.

In an alternative embodiment, instead of reading the indicator MCC_0 of the country of origin in which the

subscriber has a contract, step S2 reads a dedicated field in the memory EEPROM in which the subscriber has stored the indicator of their usual country of residence, which may be different from the country in which the subscriber has a contract. For example, for a French subscriber who has a contract with FRANCE TELECOM in France, but who is resident in Germany, and consequently has stored German called party numbers in the open format 0 NN, for example 06721 99 50 41, the country indicator in the subscriber identity IMSI corresponds to France and in this embodiment the country indicator in the dedicated field read in step S2 corresponds to Germany; in this example, the subscriber is considered to be "abroad" when outside Germany.

Step S3 determines the country in which the subscriber's terminal is located at the time of the call set-up request.

The base transceiver stations BTS (FIG. 1) periodically broadcast the identifications of their location areas on respective Broadcast Control CHannels BCCH. A Location Area Identification LAI includes a three-digit mobile country code indicator MCC_0, MCC_E of the country in which the base transceiver station is located and more generally containing the location area of the mobile services switching center MSC, MSC_E in which the base transceiver station is located, together with a mobile network code indicator MNC_0, MNC_E of the radio telephone network RRN_0, RR_E which includes the base transceiver station. The subscriber's mobile terminal periodically scrutinizes the broadcast control channel of the cell in which it is located. If the radio telephone

terminal decides to perform a change of cell (handover) at the time of periodically measuring carrier frequencies communicated by the list contained on the broadcast control channel to which the terminal is currently synchronized, the radio terminal stores in the memory EEPROM the identification LAI of the new cell to which it wishes to synchronize, and communicates its location to the old visitor location register VLR, VLR_E.

If the subscriber is traveling abroad, the identifications LAI in the broadcast control channel list no longer contain the number MNC_0 of the home mobile radio telephone network RRN_0. The mobile terminal MS' scans the radio telephone carrier frequencies to determine the broadcast control channel received best. The whole of the identification LAI_E of the new location area of the broadcast control channel is stored in the memory EEPROM, including the country indicator MCC_E and the indicator MNC_E of the foreign network RR_E.

In a first embodiment, step S3 reads the country indicator MCC_E in the location area identification LAI stored in the memory EEPROM at the time of the last transfer between areas.

In a second embodiment, a list of indicators MNC_E of foreign telephone networks RR_E is pre-stored in the memory EEPROM of the card SIM when the contract is entered into, together with the names of the corresponding countries. The operators of the networks concerned have entered into cooperation agreements with the operator of the home network RRN_0, for example. In this case, the subscriber selects on the display the foreign network RR_E of the country in which they are

currently located. Step S3 then reads the indicator MCC_E of the country covered by the selected foreign network and the indicator MNC_E of the selected foreign network in order for the terminal MS' to select a traffic channel of that network.

In the next step S4, the indicator of the country of origin MCC_0 or the indicator of the country of residence in the dedicated field, read in step S2 is compared to the indicator MCC_E of the "foreign" country contained in the location area identification LAI or selected in the table of networks. If $MCC_0 = MCC_E$, the subscriber is still in the country of origin or country of residence. The called party number NA = 0 NN can be used and remains unchanged; it is inserted into the SET UP message in step S5, as in the prior art step E6 (FIG. 2).

If MCC_0 is different from MCC_E in step S4, the subscriber is outside the country of origin or country of residence. The national called party number NA = 0 NN can no longer be used and is converted into a meaningful international number in the subsequent steps S6 to S9 in order for it to be acceptable to any foreign network.

In step S6 the field TON, which was initially at 0 for the open format, changes to 1 for the international format. In a further embodiment, the field TON can be set to 1 before step E4, for example, and changed to 0 only on executing step E6' or S5. Then, in step S7, the trunk prefix 0 is removed from the called party number NA, which becomes the meaningful national number NN. In the next step S8, the country-of-origin or residence code CC_0 is read in correspondence with the country indicator MCC_0

in a table which is pre-stored in the memory EEPROM and which establishes the correspondence between the foreign country indicators MCC_0, MCC_E and the country codes CC_0, CC_E, respectively, or is read in a dedicated field of the memory EEPROM. The country code CC_0 read in this way is added to the beginning of the national number NN. The called party number CC_0 NN with the field TON = 1 is inserted into the SET UP message in step S9, as in step E9. Finally, in the final step EF the set up message is transmitted to the switching center MSC_E to which the telephone terminal MS' is temporarily logged on.

The invention provides the option in step S9 of adding the international code + to the meaningful international number CC_0 NN and of writing the called party number + CC_0 NN in the directory in the memory EEPROM in the card SIM instead of the original number 0 NN. In this case, as and when called party numbers of the country of origin or residence are used by the subscriber when abroad, those numbers will be stored in the international format and processed quickly by steps E7, E8 and E9.

In a simpler embodiment, if an open format called party number NA in the form NA = 0I AB PQ MCDU is to be entered on the keypad or spoken into the terminal MS, whether the terminal is in the country of origin or residence or abroad, the called party number NA being entered is automatically converted into the international format + CC_0 I AB PQ MCDU. In this case, step S7 of removing the trunk prefix 0, step S8 of adding of the country of origin or residence code CC_0 and the addition

to step S9 of writing the called party number in the international format + CC_0 NN are transferred into step E2 before writing completely the called party number converted to the international format in the memory EEPROM of the card SIM of the mobile radio telephone terminal.

Similarly, if the called party number being entered is an open format international number beginning with the international prefix 00, this prefix is replaced by the international code + before writing the complete called party number into the memory EEPROM of the card SIM of the terminal.

In this simple embodiment, the FIG. 3 method includes the succession of steps S7, S8 and the addition to step S9 corresponding to writing in step E2, enabling and reading in step E4, and steps E7, E8 and E9 if the called party number entered is a national number beginning with the trunk prefix 0.

WHAT I CLAIM IS :

1. A method of dialing used in a radio telephone terminal, characterized by the following steps if a called party number is not an international number:

- determining an indicator of the country in which said terminal is currently located,

- comparing a country-of-origin indicator to the determined indicator of the country in which said terminal is currently located,

- not modifying said called party number if the compared country indicators are identical, and

- automatically adding a country-of-origin code to the beginning of said called party number if said compared country indicators are different.

2. A method according to claim 1, including reading said country-of-origin indicator in a subscriber identity stored in said terminal.

3. A method according to claim 1, including reading said country-of-origin indicator in a dedicated field of a memory of said terminal.

4. A method according to claim 1, wherein the determination step includes reading said indicator of the country in which said terminal is currently located, in a location area identification stored in said terminal.

5. A method according to claim 1, wherein said step of determining includes the following steps:

- selecting a radio telephone network of said country in which said terminal is currently located from a table of networks stored in said terminal, and

- reading said indicator of the country in which said terminal is currently located in said table in correspondence with the selected network.

6. A method according to claim 1, including removing a trunk prefix from said called party number before said step of adding.

7. A method according to claim 1, including removing a trunk prefix from said called party number before the step of adding if the compared country indicators are different.

8. A method according to claim 1, including reading said country-of-origin code in a dedicated field of a memory of said terminal.

9. A method according to claim 1, including reading said country-of-origin code in correspondence with said country-of-origin indicator in a table of countries stored in said terminal.

10. A method according to claim 1, including setting a type-of-number field included in a dialing set up message transmitted by said terminal, to an international format state if the compared country indicators are different.

11. A method according to claim 1, wherein said step of adding precedes writing said called party number in a memory of said terminal.

12. A method according to claim 1, wherein said step of comparing follows reading of said called party number in a memory of said terminal.

13. A method according to claim 1, including, after the step of adding, a step of adding an international code to the beginning of said called party number in order to write it as an international number in a memory of said terminal.

14. A method according to claim 1, wherein, if a called party number is preceded by an international code or prefix, the international code or prefix is removed from the above called party number.

15. A method according to claim 14, including setting a type-of-number field included in a dialing set up message transmitted by said terminal, to an international format state if the called party number is a number preceded by an international code or prefix.

16. A radio telephone terminal storing in a memory an algorithm for implementing a method of dialing including the following steps if a called party number is not an international number:

- determining an indicator of the country in which said terminal is currently located,

- comparing a country-of-origin indicator to the determined indicator of the country in which said terminal is currently located,

- not modifying said called party number if the compared country indicators are identical, and

- automatically adding a country-of-origin code to the beginning of said called party number if said compared country indicators are different.

17. A subscriber identification module adapted to be inserted in a radio telephone terminal storing in a memory an algorithm for implementing a method of dialing including the following steps if a called party number is not an international number:

- determining an indicator of the country in which said terminal is currently located,

- comparing a country-of-origin indicator to the determined indicator of the country in which said terminal is currently located,

- not modifying said called party number if the compared country indicators are identical, and

- automatically adding a country-of-origin code to the beginning of said called party number if said compared country indicators are different.

ABSTRACT OF THE DISCLOSURE

The invention aims at facilitating the use of numbers of called party in the country of origin of a subscriber having a mobile radio telephone terminal, when the subscriber is travelling abroad. When the called number NA = 0 NN is not an international number, a country-of-origin indicator read in the subscriber identity IMSI and an indicator of the country in which the terminal is currently located, read in a local area identification are compared. The called party number is not modified when the compared country indicators are identical. A country-of-origin code is added at the beginning of the called party number when the compared country indicators are different, so that the number transmitted by the terminal is in the international format.

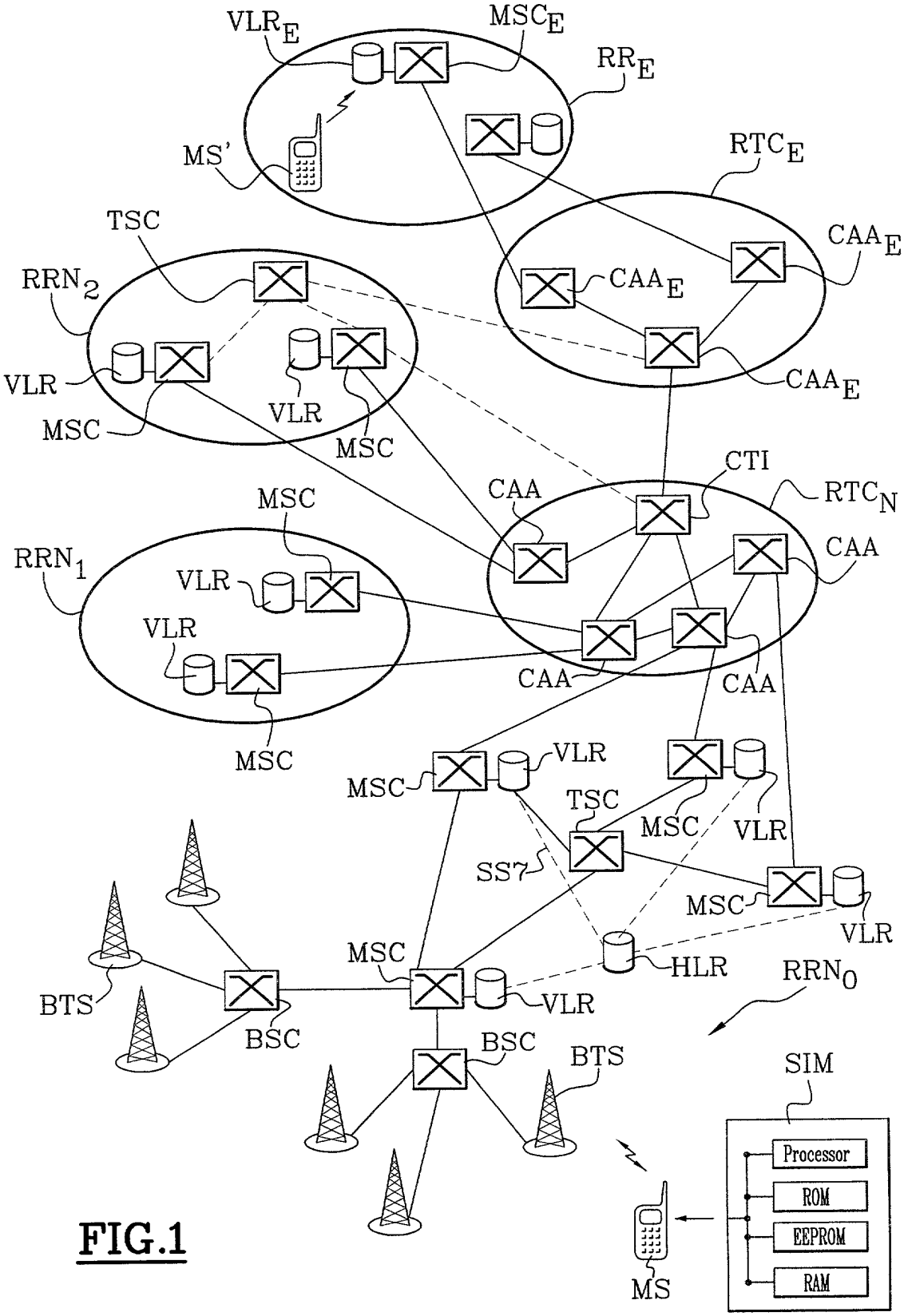

VLR_E
MSC_E
RR_E
MS'
RTC_E
CAA_E
CAA_E
CAA_E
TSC
RRN_2
VLR
MSC
VLR
MSC
CTI
RTC_N
CAA
CAA
MSC
RRN_1
VLR
VLR
MSC
CAA
CAA
MSC
VLR
TSC
MSC
VLR
SS7
MSC
VLR
HLR
RRN_0
MSC
VLR
BTS
BSC
BSC
BTS
SIM
Processor
ROM
EEPROM
RAM
MS

FIG.1

FIG.2

(PRIOR ART)

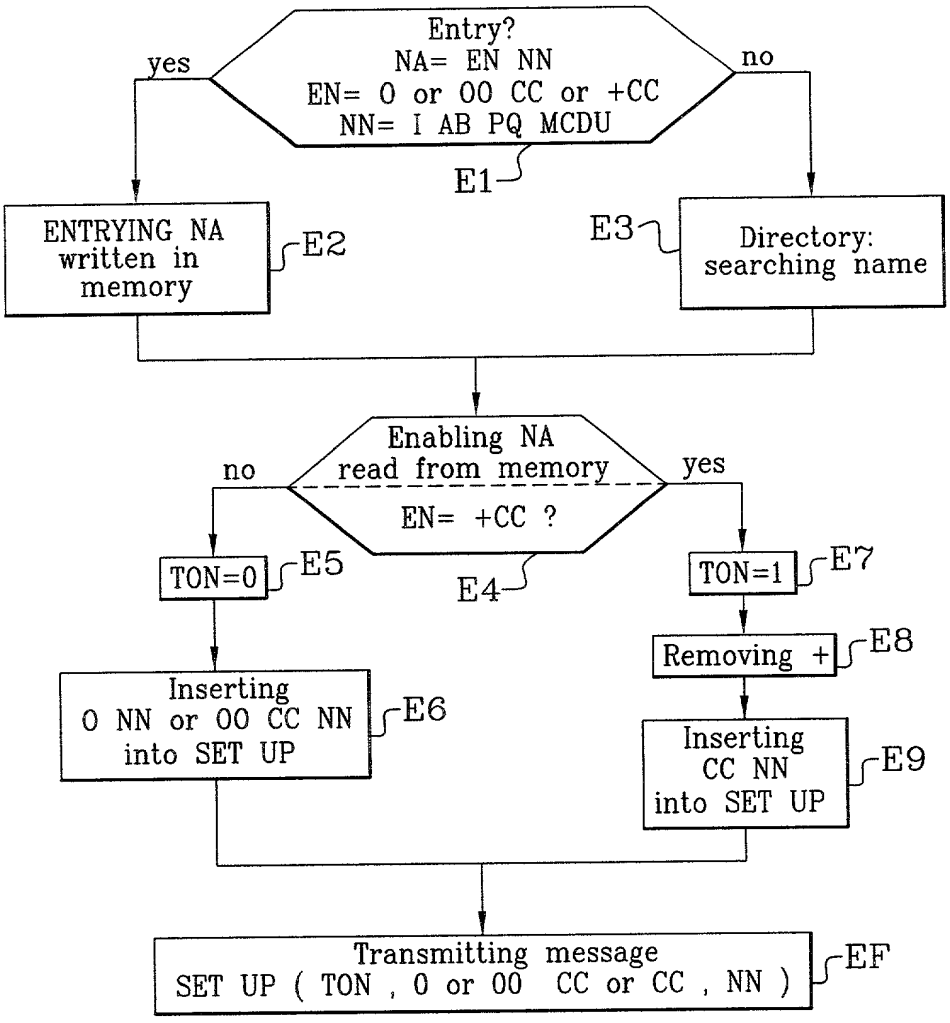
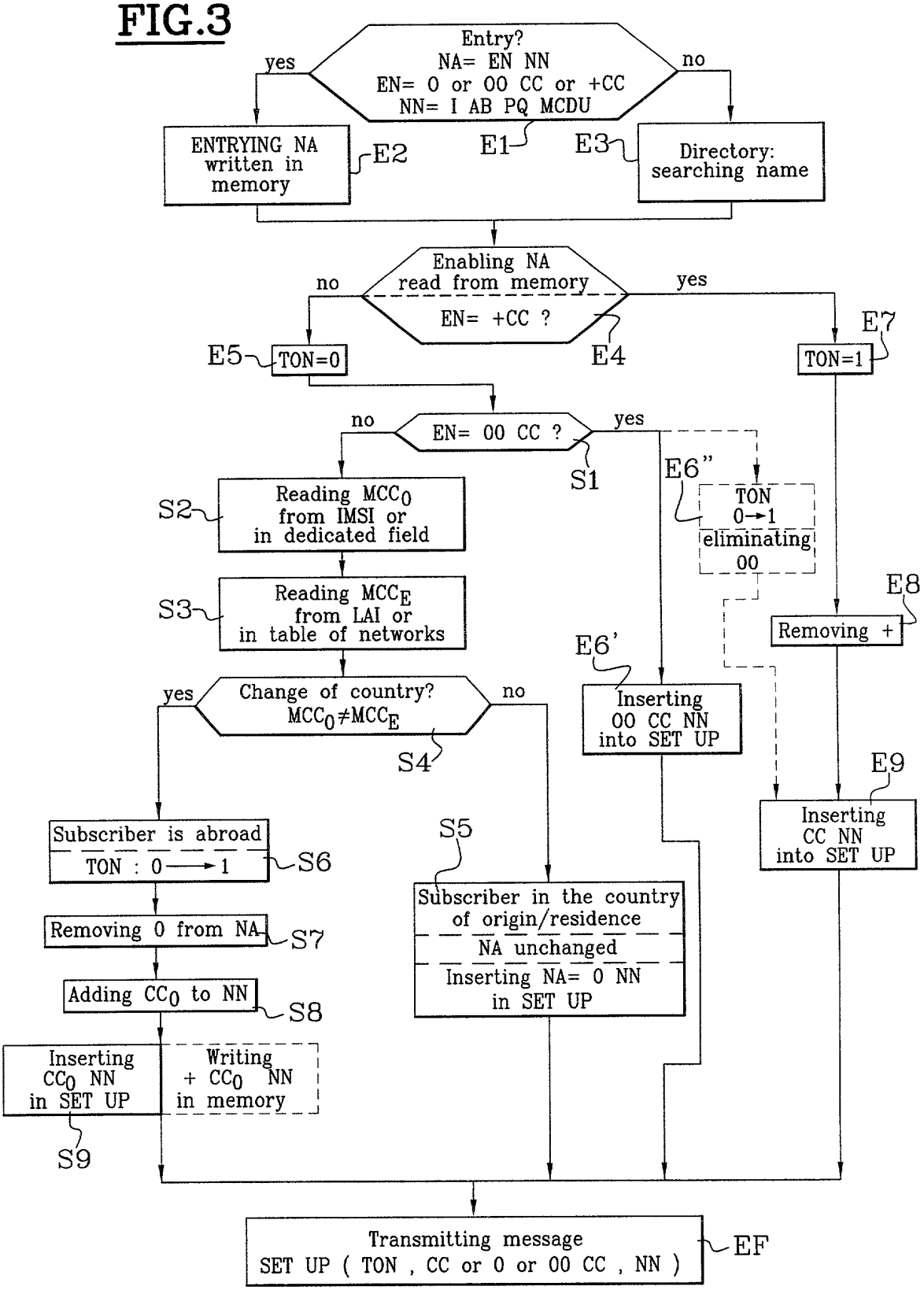


FIG.3


Entry?
NA= EN NN
EN= 0 or 00 CC or +CC
NN= I AB PQ MCDU
yes
no
E1
ENTRYING NA written in memory
E2
E3
Directory: searching name
Enabling NA read from memory
EN= +CC ?
E4
no
yes
E5
TON=0
TON=1
E7
EN= 00 CC ?
S1
E6"
TON 0→1 eliminating 00
S2
Reading MCC0 from IMSI or in dedicated field
S3
Reading MCCE from LAI or in table of networks
E8
Removing +
E6'
Inserting 00 CC NN into SET UP
Change of country? MCC0≠MCCE
S4
E9
Inserting CC NN into SET UP
Subscriber is abroad
TON : 0→1
S6
S5
Subscriber in the country of origin/residence
NA unchanged
Inserting NA= 0 NN in SET UP
Removing 0 from NA
S7
Adding CC0 to NN
S8
Inserting CC0 NN in SET UP
Writing + CC0 NN in memory
S9
Transmitting message
SET UP (TON , CC or 0 or 00 CC , NN)
EF

Docket No.: 324-

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter claimed and for which a patent is sought on the invention entitled "Dialing in a mobile radio telephone terminal after an international transfer", the specification of which

[ ] is attached hereto [X] was filed on June 29, 2001 as Application Serial No. 09/869,570
and was amended on (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is known to me to be material to patentability in accordance with Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT international application which designated at least one country other than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s):			Priority Claimed?	
Number	Country	Day/Month/Year filed	Yes	No
98-16731	FRANCE	31/12/1998	X	

I hereby authorize the U. S. attorneys and agents named herein to accept and follow instructions from CABINET MARTINET & LAPOUX as to any actions to be taken in the Patent and Trademark Office regarding this application without direct communication between the U. S. attorney(s) and the undersigned. In the event of a change in the person(s) from whom instructions may be taken, the U.S. attorney(s) will be so notified by the undersigned.

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s), or Section 365(c) of any PCT international application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Prior U. S. Application(s):

Serial No.	Filing Date	Status: Patented, Pending, Abandoned
PCT international application No. PCT/FR99/03324	28 December 1999	Pending

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby appoint the following attorney(s) and/or agent(s): Allan M. Lowe, Reg. No. 19,641; Israel Gopstein, Reg. No. 27,333; Benjamin J. Hauptman, Reg. No. 29,310; Kenneth M. Berner, Reg. No. 37,093, Michael G. Gilman, Reg. No. 19,114; and Randy Noranbrock, Reg. No. 42,940, all of

LOWE HAUPTMAN GOPSTEIN GILMAN & BERNER, LLP
1700 Diagonal Road, Suite 310
Alexandria, Virginia 22314

with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and all future correspondence should be addressed to them.

Full name of sole or first inventor: **SANBAR Ramzi**

Inventor's signature: Date: 11th Sept.2001

Residence: **LONDON - GRANDE-BRETAGNE** FRX

Citizenship: **FRENCH**

Post Office Address: **3, Rutland Court, Rutland Gardens, London SW7 1BN, GRANDE-BRETAGNE**

Full name of second joint inventor:

Inventor's signature: Date:

Residence:

Citizenship:

Post Office Address:

Full name of third joint inventor :

Inventor's signature : **Date :**

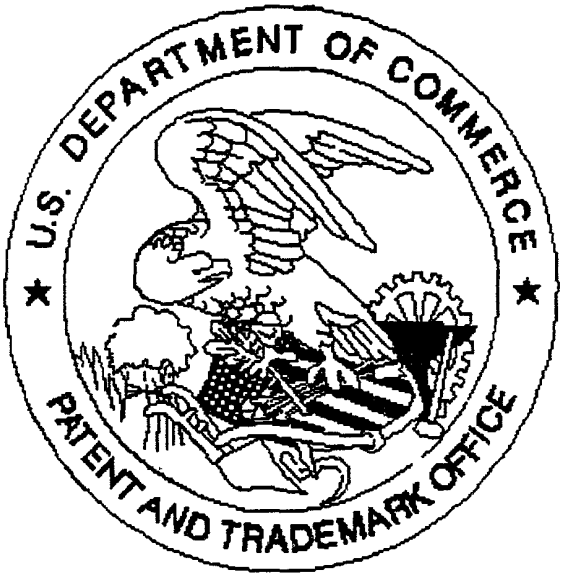
Residence :

Citizenship :

Post Office Address :

United States Patent & Trademark Office

Office of Initial Patent Examination -- Scanning Division



Application deficiencies found during scanning:

☐ Page(s)_____of_____ were not present for scanning. (Document title)

☐ Page(s)_____of_____were not present for scanning. (Document title)

☑ ***Scanned copy is best available.*** Page numbered 1 of specification is Abstract.